

Preservation Activities at the Library of Congress

Part 2: Information Model

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Part 2: Information Model

Purpose

This information model is a structured representation of the information required to manage the processes and activities for which the Preservation Directorate is responsible.

It is intended to serve as a means of clarifying the extent of the Directorate's information requirements and the interrelationships between and among those requirements.

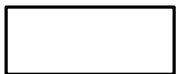
The information model is also intended to serve as a means of identifying areas of interface between the information required to manage the preservation activity *per se* and information that is generated and/or used in other library functions.

Scope

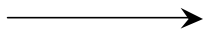
The information model is centred on the information required to support the processes and activities carried out within the Preservation Directorate at the Library of Congress. It is intended to provide a comprehensive inventory of the classes of information required to manage those activities. Further consultation within LC will be required to determine how fully the draft model reflects the information required to support preservation activities managed in custodial divisions outside the Preservation Directorate.

Earlier drafts of the information model were reviewed with managers and staff from the five divisions within the Directorate as well as with participants in a focus group comprising representatives from a number of other research libraries. This revised and expanded draft incorporates additions and changes to the information model identified in the course of both internal and external review.

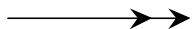
Diagramming Conventions



A rectangle represents an entity (i.e., an object, agent, activity, event, etc.) about which information is needed in order to support a process or activity.



A single-headed arrow on a line represents a relationship in which any given instance of the entity at the opposite end of the line may be associated with only one instance of the entity to which the arrow is pointing.



A double-headed arrow on a line represents a relationship in which any given instance of the entity at the opposite end of the line may be associated with one or more instances of the entity to which the arrow is pointing.



A dotted-line rectangle surrounding a group of two or more entities indicates that a relationship represented by an arrow contiguous with the dotted line may apply to any and/or all of the entities represented within the rectangle.

Information Model Structure

The information model is set out in a series of seventeen entity-relationship diagrams (Figures 2 through 18). Each of the diagrams depicts a group of objects, agents, activities, events, etc. about which information is required in order to support the activities of the Preservation Directorate. Definitions for the entities depicted are provided in tables following each of the diagrams.

The first diagram in the information model (Figure 2) is extracted from the model produced for the IFLA study on the Functional Requirements for Bibliographic Records (FRBR). The diagram provides a point of reference for the *item* entity that recurs as a key entity in each of the subsequent diagrams in this information model. It also serves as a shorthand means of incorporating the entities *work*, *expression*, and *manifestation* into the information model for preservation.

The next three diagrams (Figures 3, 4, and 5) depict three sets of key entity groups that are central to the preservation activity and as such recur repeatedly in subsequent diagrams in the information model. The first (Figure 3) extends the FRBR model to illustrate the relationship between the *item* entity and its aggregate and component entities (*item aggregate*, *item part*, and *element*). The next (Figure 4) depicts the “tools of the trade” for the preservation activity: *procedure*, *material*, *equipment*, *system*, and *facility*. The third (Figure 5) depicts the *employee* and related entities *skill time* and *unit*.

The remaining thirteen diagrams in the information model (Figures 6 through 18) depict the information requirements for each of thirteen process and activity groupings derived from the process model overview: marking (Figure 6); monitoring (Figure 7); assessing and scheduling (Figure 8); replacement (Figure 9); preparation and quality review (Figure 10); shipping and receiving (Figure 11); housing, binding, treatment, and reformatting (Figure 12); storing (Figure 13); disposition and delivery (Figure 14); routing and tracking (Figure 15); planning (Figure 16); maintaining equipment and supplies (Figure 17); and research, training, and outreach (Figure 18).

Figure 2: Information Model – FRBR Group 1 Entities and Primary Relationships

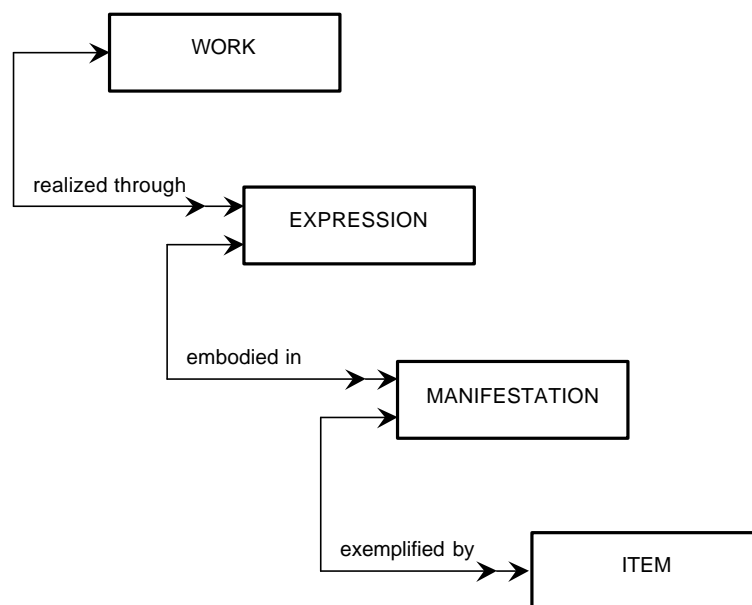


Table 2: Information Model – FRBR Group 1 Entities - Entity Definitions

Entity	Definition / Inclusions / Exclusions
Work	A distinct intellectual or artistic creation. FRBR includes variants—such as revisions, updates, abridgements; added parts, accompaniment, transcriptions and arrangements of music; dubbed or subtitled versions of films, and translations—as expressions of the same original work. Modifications involving a significant degree of independent intellectual or artistic effort—such as paraphrases, rewritings, parodies, musical variations on a theme, dramatizations, adaptations, abstracts, digests, and summaries—are viewed as new works.
Expression	The intellectual or artistic realization of a work in the form of alpha-numeric, musical, or choreographic notation, sound, image, object, movement, etc., or any combination of such forms. Expression encompasses the specific words, sentences, paragraphs, etc. resulting from the realization of a work in the form of a text. Expression excludes aspects of physical form—such as typeface and page layout—that are not integral to the intellectual or artistic realization of the work as such.
Manifestation	The physical embodiment of an expression of a work. Manifestation includes unique embodiments of a work (e.g., an author's manuscript, an original painting), as well as embodiments produced in multiple copies, either for broad dissemination (e.g., a published book, a commercial sound recording) or for more limited purposes (e.g., a photocopy of an original typescript, a dubbing of a recording of an original piece of music). The set of copies produced in each case constitutes a manifestation.
Item	A single exemplar of a manifestation. The item may be a single physical object (e.g., a copy of a one-volume monograph, a single audio cassette), or it may comprise more than one physical object (e.g., a monograph issued in two separately bound volumes, a recording issued on three separate compact discs).

Figure 3: Information Model – Item Aggregate / Item / Item Part / Element

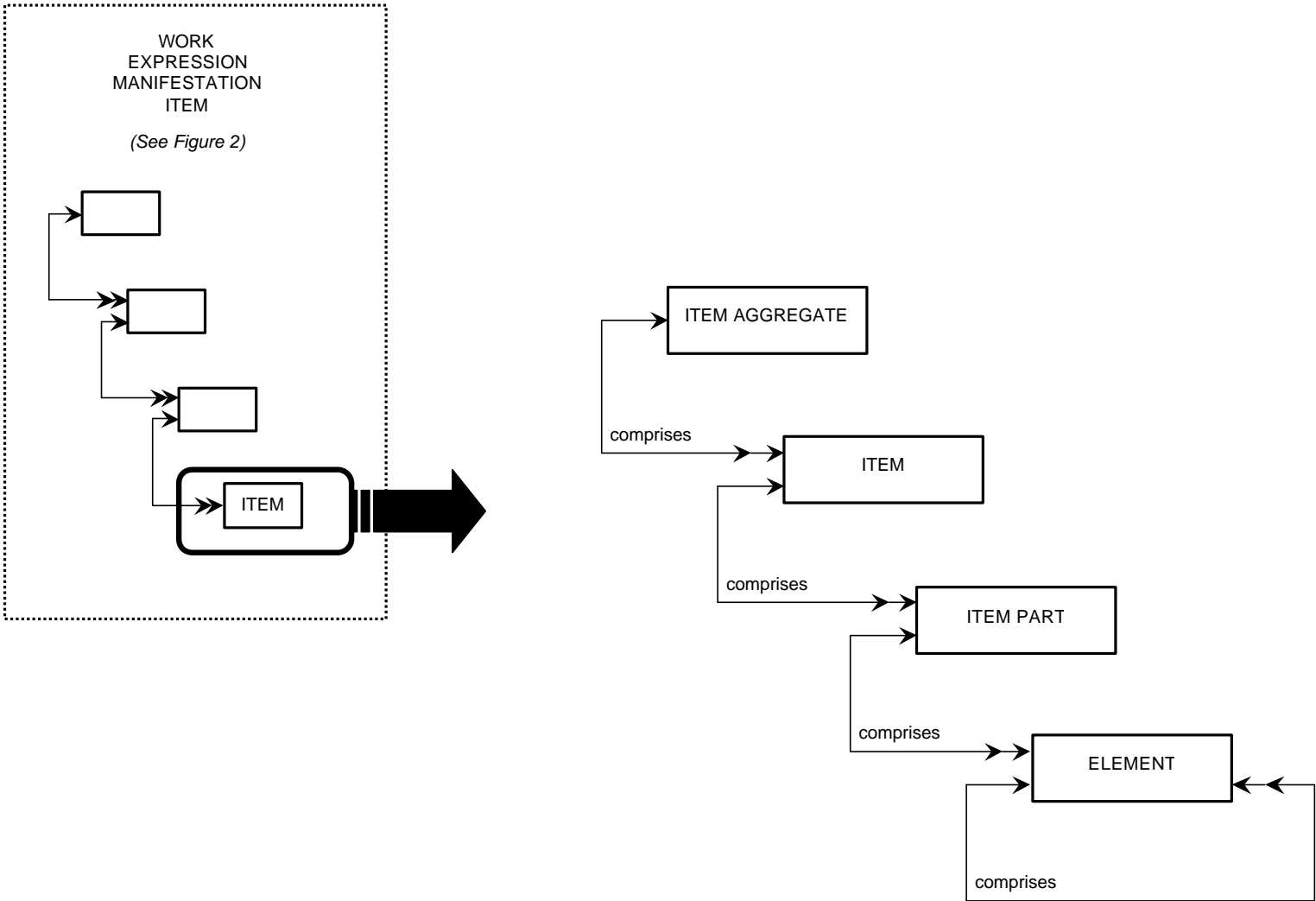


Table 3: Information Model – Aggregate / Item / Part / Element – Entity Definitions

Entity	Definition / Inclusions / Exclusions
Item Aggregate	A named group of items. Includes collections of both published and unpublished materials assembled by the library or by a previous owner. Excludes published collections (i.e. publications comprising two or more independent works).
Item	See definition in Table 2.
Item Part	A physically separate component of an item. Includes separately bound volumes forming part of a multi-volume item; separate cassettes, reels, discs, etc. forming part of a multi-part item; separate (unbound) issues of a serial. Excludes supplementary material issued as a separate item.
Element	A discrete component of an item that is physically integrated with an item part. Includes components such as binding, text block, cassette housing, etc.

Figure 4: Information Model – Procedure / Material / Equipment / System / Facility

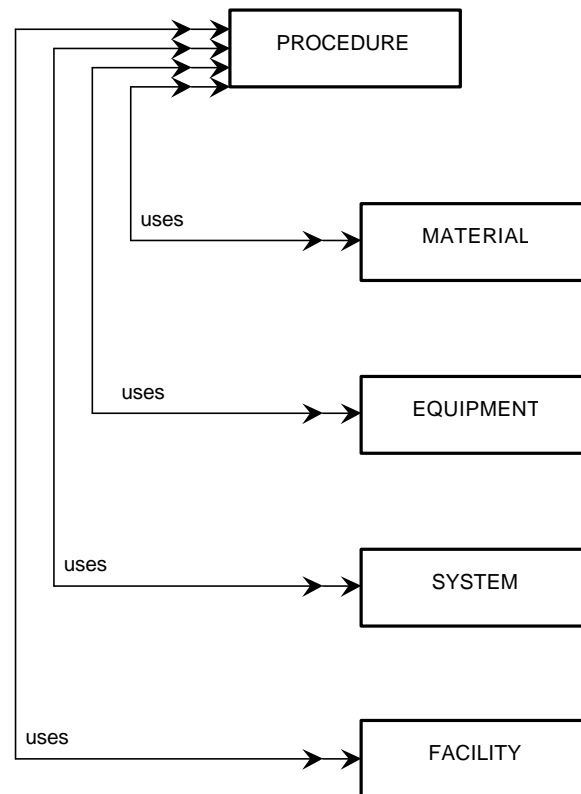


Table 4: Information Model – Procedure / Material / Equipment / System / Facility – Entity Definitions

Entity	Definition / Inclusions / Exclusions
Procedure	A set of instructions (either documented or formalized by practice) establishing the sequence of steps, actions, and methods for accomplishing a defined task. Includes established procedures for tasks related to housing, binding, treatment, reformatting, etc.; procedures for assessing the condition of an item; testing and experimental procedures.
Material	A physical or chemical substance. Includes materials and supplies used in housing, binding, treatment, reformatting, etc.; chemicals used in testing and experimentation.
Equipment	A tool, device, or piece of furniture or machinery. Includes tools, devices, furniture, machinery, etc. used in housing, binding, treatment, reformatting, etc.; devices used to play, project, operate, or use the content of an item; tools, devices, and machinery used in testing or experimentation. Includes equipment owned or leased either by the library or by a vendor.
System	A set of operations performed by a computer or similar device. Includes digital imaging systems, textual digitization systems, [digital sound production systems].
Facility	A building or part of a building. Includes regular library storage facilities; special facilities (e.g., cold storage vaults); special processing facilities (e.g., mass deacidification facilities; fumigation facilities). Includes facilities owned or leased either by the library or by a vendor.

Figure 5: Information Model – Employee / Skill Time / Unit

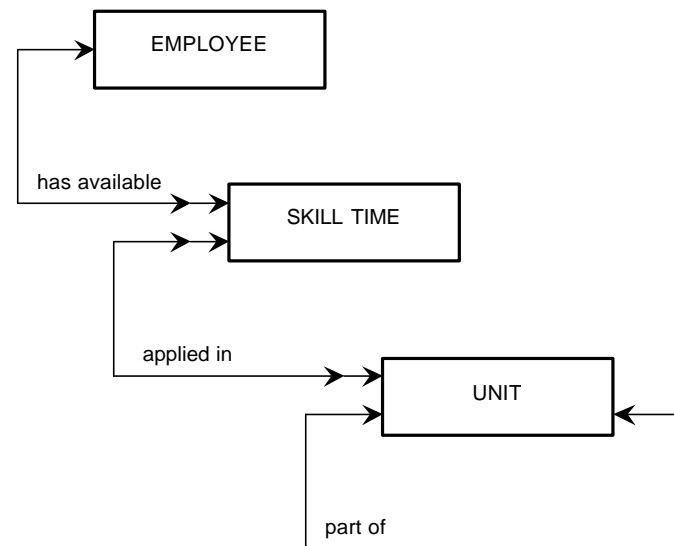


Table 5: Information Model – Employee / Skill Time / Unit – Entity Definitions

Entity	Definition / Inclusions / Exclusions
Employee	A person employed by the library. Includes both full-time and part-time employees; casual, short-term, and long-term employees. Excludes persons hired under contract; employees of contractors and vendors.
Skill Time	An amount of time available for an employee to perform a particular skill. Includes time available for the application of skills relating to housing, binding, treatment, and reformatting.
Unit	A component of an organization. Includes departments, directorates, divisions, sections, work units, project teams, etc. established as part of the overall organization of the library. Excludes committees, task forces, and other groups operating on an ad hoc basis independently of the positions formally occupied by group participants.

Figure 6: Information Model – Marking

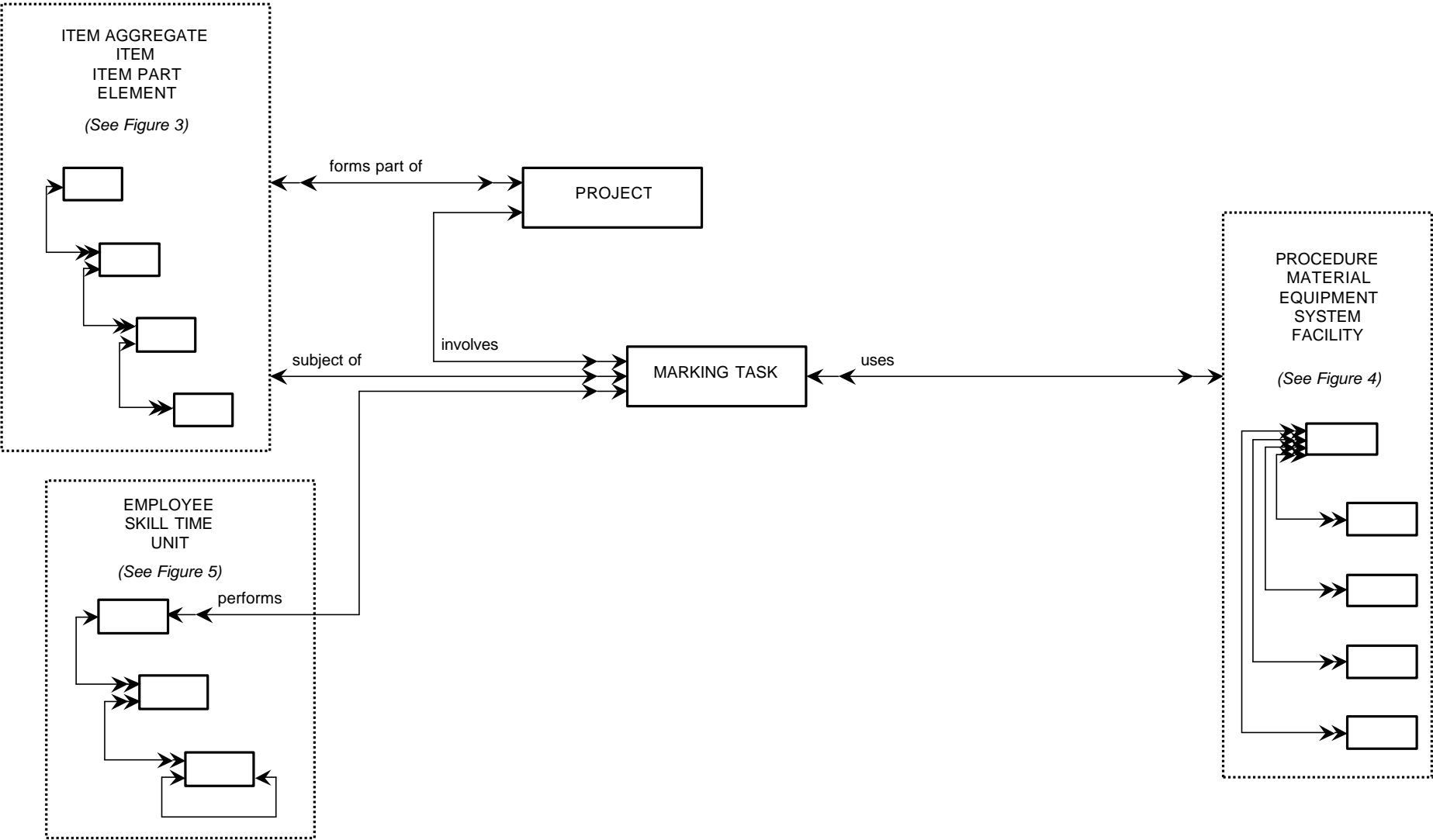


Table 6: Information Model – Marking – Entity Definitions

Entity	Definition / Inclusions / Exclusions
Item aggregate, etc.	See definitions in Table 3.
Employee, etc.	See definitions in Table 5.
Project	A plan or set of tasks associated with the achievement of a specific objective or initiative. Includes projects for the processing, treatment, or reformatting of a specific collection or group of items.
Marking task	A task associated with the process of applying a label or other mark or device to an item for purposes of identification and/or security. Includes tasks such as the application of call number labels, bar codes, property stamps, bookplates, and security strips; encryption, watermarking, etc. of digital materials.
Procedure, etc.	See definitions in Table 4.

Figure 7: Information Model – Monitoring

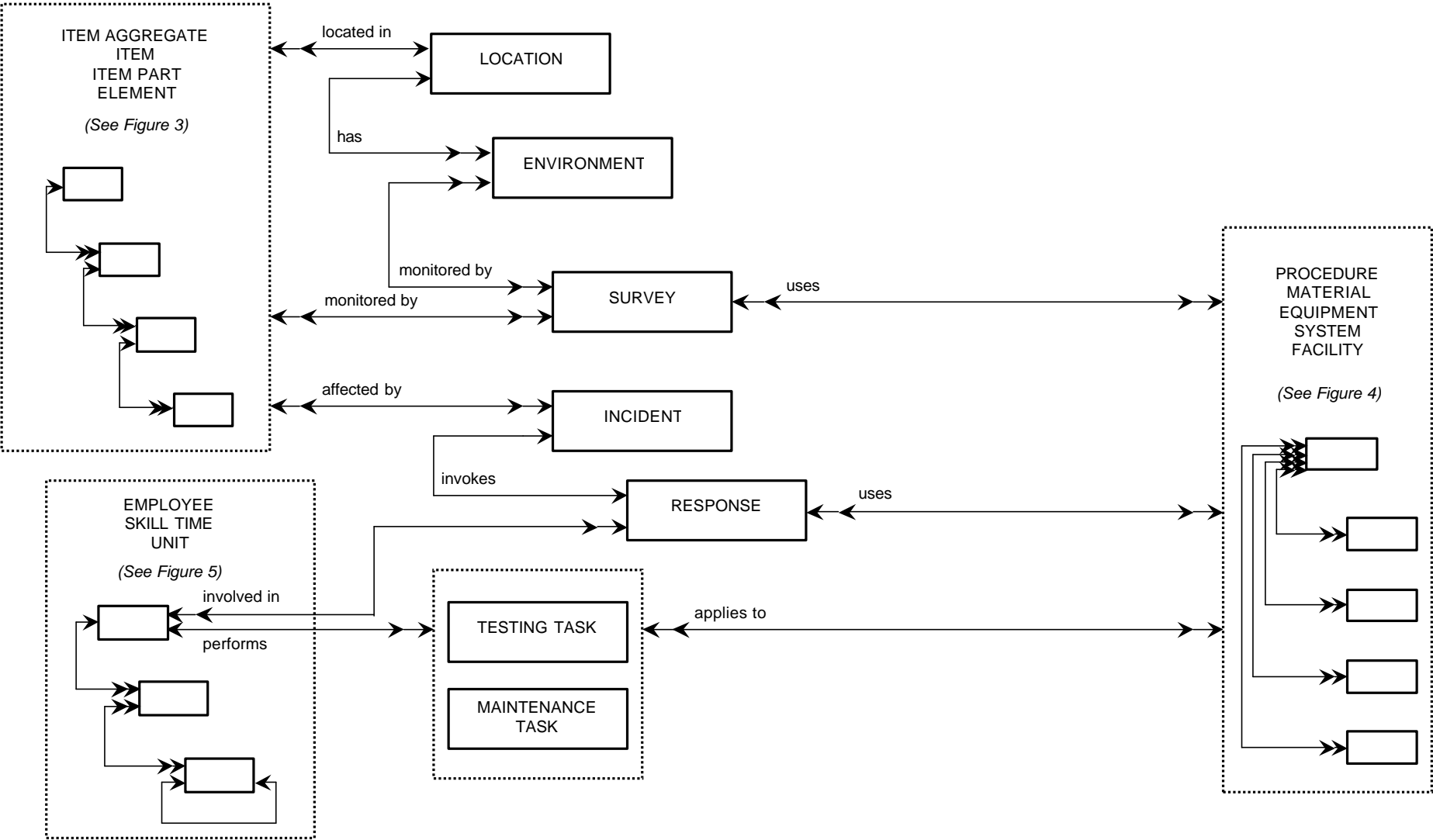


Table 7: Information Model – Monitoring

Entity	Definition / Inclusions / Exclusions
Item aggregate, etc.	See definitions in Table 3.
Employee, etc.	See definitions in Table 5.
Location	An identifiable physical area or facility. Includes processing areas, temporary storage areas, exhibition areas, off-site facilities.
Environment	The environmental conditions (temperature, relative humidity, light levels, air quality, etc.) to which an item or group of items is exposed on either a long-term or short-term basis. Includes environmental conditions in permanent storage areas, processing areas, exhibition areas, etc.
Survey	A scientifically conducted process designed for the purposes of collecting and tabulating data. Includes condition surveys of collection materials; surveys of environmental conditions.
Incident	An unscheduled or unpredictable event affecting library collections and/or facilities. Includes incidents resulting from the malfunctioning of mechanical systems and utilities (heating, ventilation, air-conditioning, plumbing, etc.); incidents involving fire, flood, storms, earthquakes, chemical spills, etc.; infestations of pests, fungi, etc.
Response	A set of procedures invoked in response to an incident affecting library collections and/or facilities. Includes control and recovery procedures undertaken during or immediately following an incident. Excludes subsequent treatment applied to items.

Testing task	A task associated with testing a procedure, material, equipment, or a facility. Includes testing procedures such as disaster response procedures; testing materials or products to determine whether they conform to established specifications or standards; testing the performance of equipment.
Maintenance task	A task associated with maintaining supplies, equipment, or a facility. Includes maintenance of an inventory of materials and supplies; scheduled and ad hoc maintenance of equipment or a facility.
Procedure, etc.	See definitions in Table 4.

Figure 8: Information Model – Assessing / Scheduling

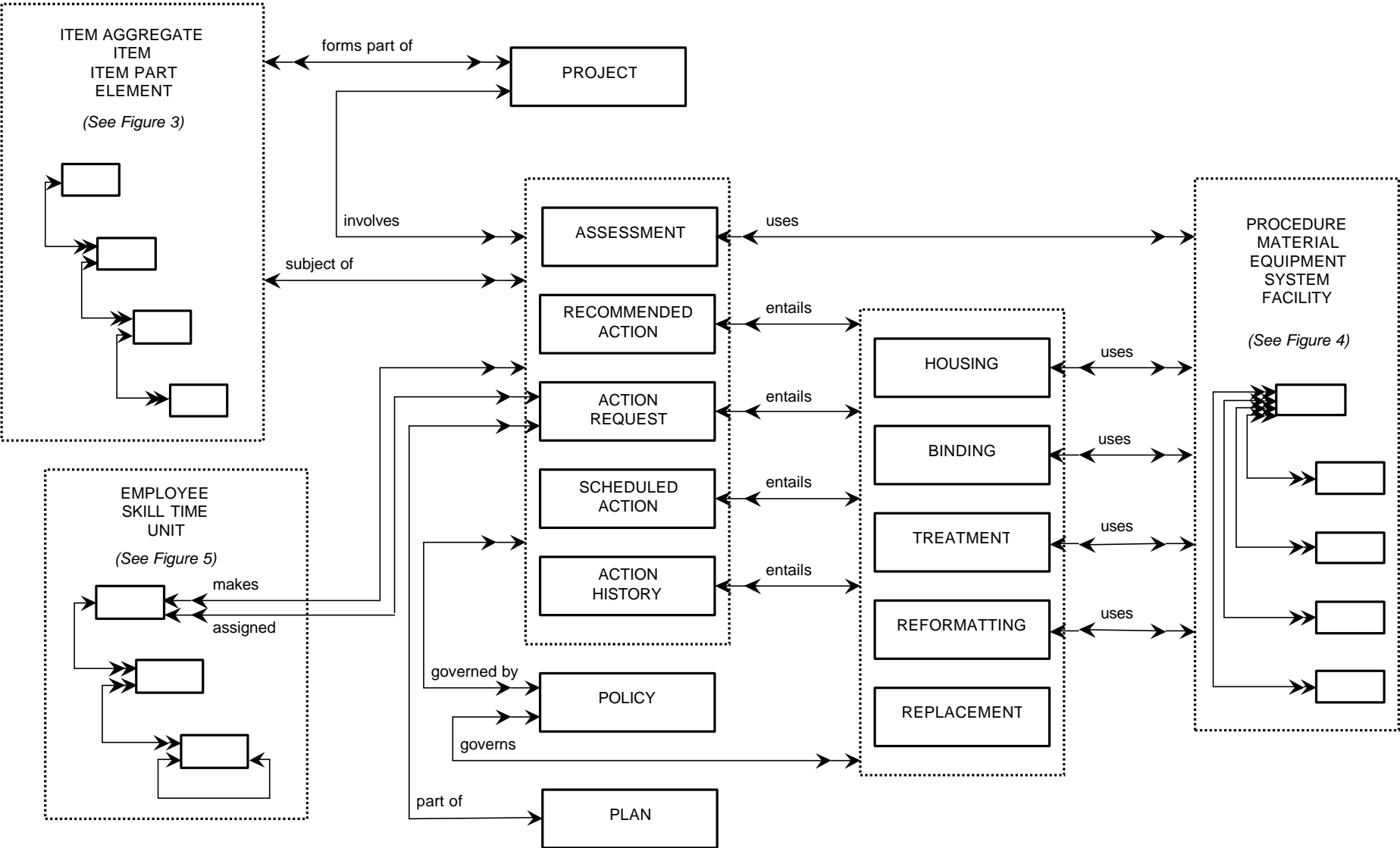


Table 8: Information Model – Assessing / Scheduling – Entity Definitions

Entity	Definition / Inclusions / Exclusions
Item aggregate, etc.	See definitions in Table 3.
Employee, etc.	See definitions in Table 5.
Project	See definition in Table 6.
Assessment	An evaluation of the physical condition and/or potential use of an item or group of items. Includes assessment of physical properties such as brittleness, discolouration, degradation, etc.; assessment of damage from tearing, scratching, mutilation, etc.; evaluation of serviceability; checking reproduction rights, etc.; checking availability of existing masters; marking items to indicate assessment results (e.g. pH neutrality).
Recommended action	A recommendation with respect to the housing, binding, treatment, reformatting, or replacement of an item or group of items. Includes recommendations emanating from condition surveys, ad hoc examination of items or groups of items, and assessments of damage resulting from incidents.
Action request	A requisition for an action or service. Includes requests relating to housing, binding, treatment, or reformatting. Includes requests for ILL, cataloguing, etc.
Scheduled action	The queuing of an item or group of items for housing, binding, treatment, or reformatting. Includes ad hoc scheduling as a result of assessment and specific recommended action; periodic scheduling for preventive treatment or migration; periodic scheduling of serial issues for binding.

Action history	A record of housing, binding, treatment, and reformatting performed with respect to an item or group of items. Includes records of procedures performed, materials used, chemicals and solutions applied, alterations made, etc.
Policy	An administrative plan or set of guidelines documenting acceptable actions and practices relating to preservation activities within the library. Includes guidelines relating to housing, binding, treatment, or reformatting; guidelines and standards for the use of materials for housing, storing, and handling items and collections; guidelines relating to clearance of copyright, etc.
Plan	A set of objectives, projects, tasks, etc. incorporating estimates of resource requirements. Includes quarterly, annual, multi-year plans for directorates, divisions, sections, etc.; project plans, grant proposals, etc.
Housing	See definition in Table 1.
Binding	See definition in Table 1.
Treatment	See definition in Table 1.
Reformatting	See definition in Table 1.
Replacement	See definition in Table 1.
Procedure, etc.	See definitions in Table 4.

Figure 9: Information Model – Replacement

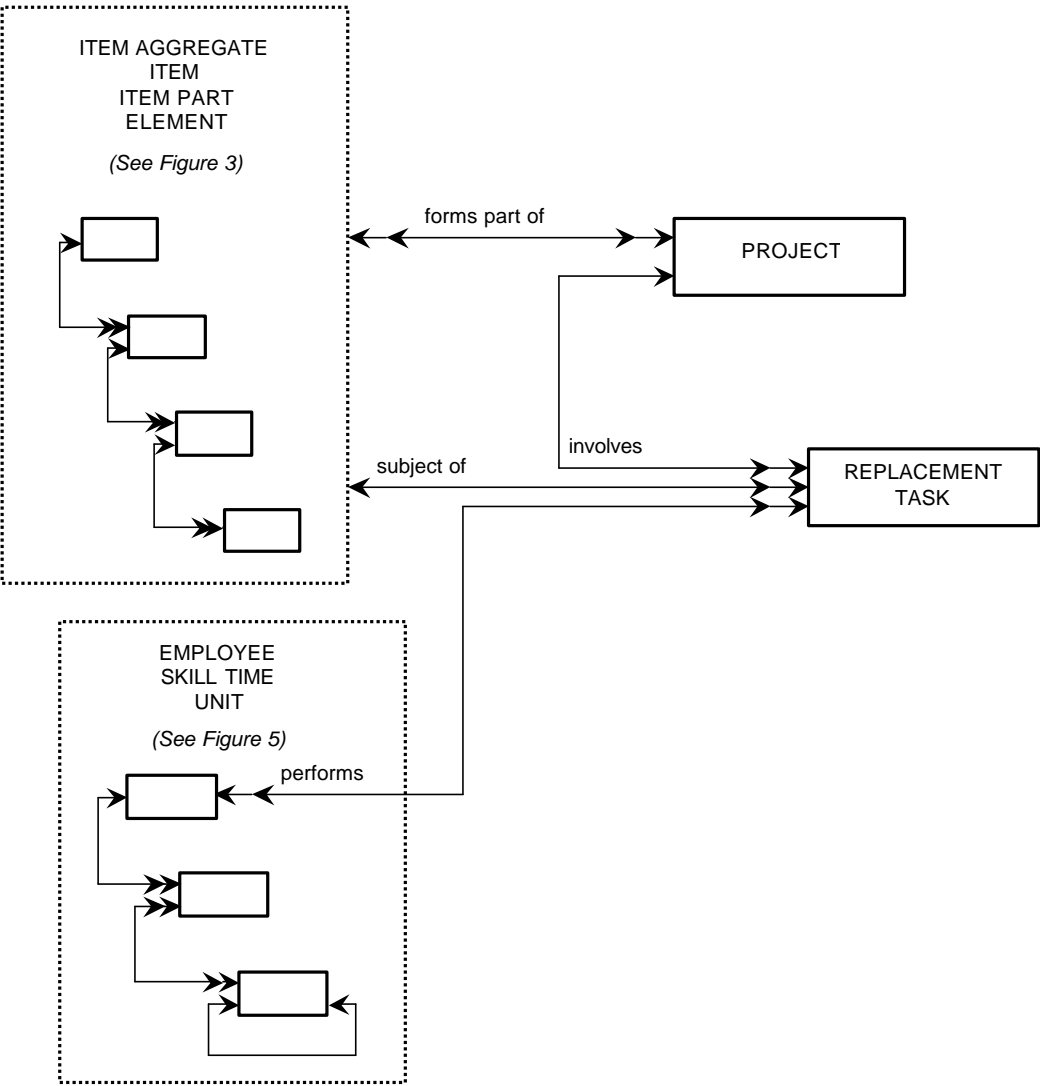


Table 9: Information Model – Replacement – Entity Definitions

Entity	Definition / Inclusions / Exclusions
Item aggregate, etc.	See definitions in Table 3.
Employee, etc.	See definitions in Table 5.
Project	See definition in Table 6.
Replacement task	A task associated with the process of designating an item for replacement. Includes tasks such as the identification of items as candidates for replacement; the reporting of candidate items to acquisitions staff; following up on the ordering of a replacement.

Figure 10: Information Model – Preparation / Quality Review

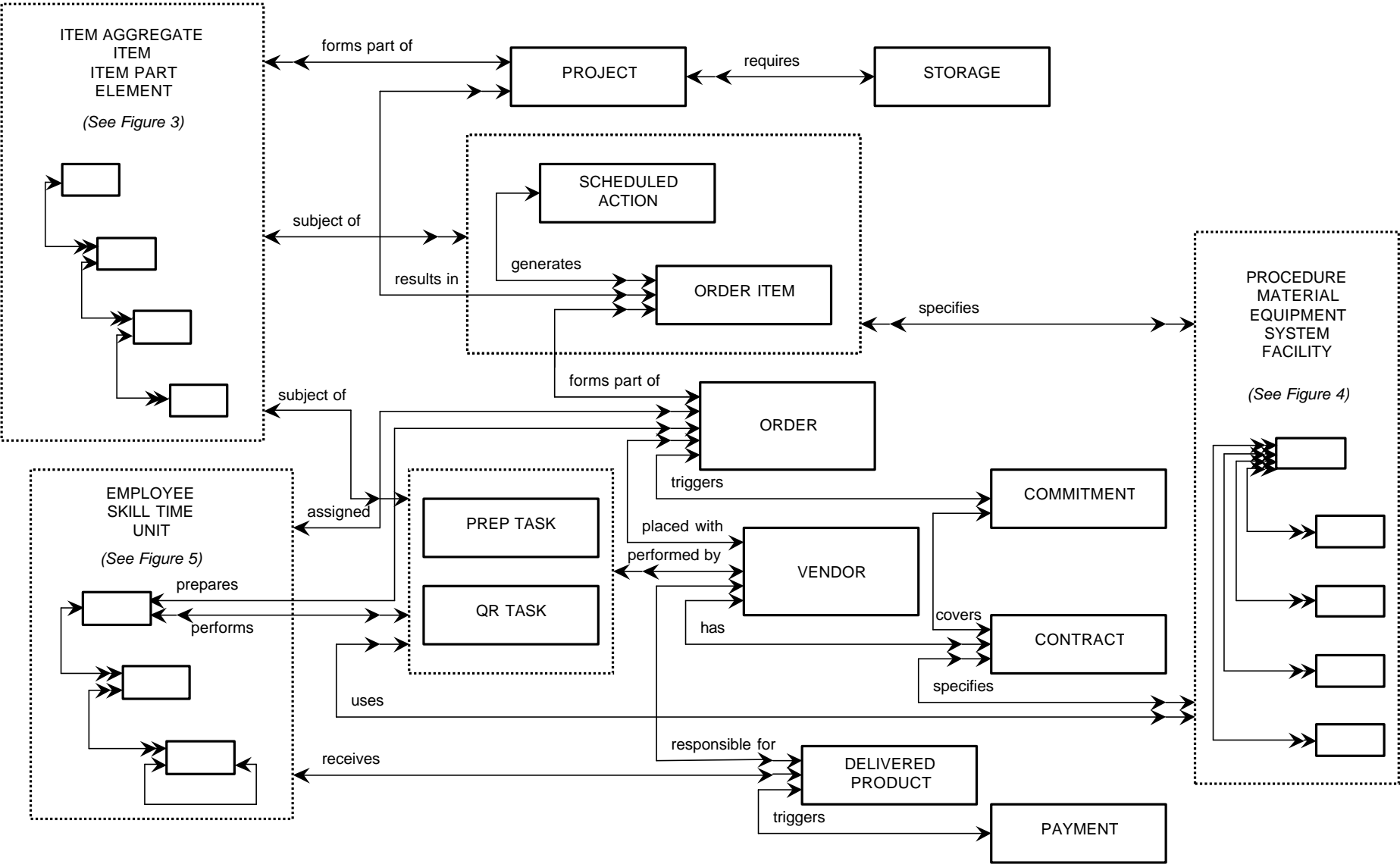


Table 10: Information Model – Preparation / Quality Review – Entity Definitions

Entity	Definition / Inclusions / Exclusions
Item aggregate, etc.	See definitions in Table 3.
Employee, etc.	See definitions in Table 5.
Project	See definition in Table 6.
Storage	A facility, area or medium used to store items and groups of items on either a temporary or permanent basis during or after preservation processing. Includes holding areas, backlog storage, etc.; special facilities (e.g. cold storage and freezer facilities) for the temporary storage of rare, fragile, or damaged materials awaiting treatment; digital storage media for the temporary or permanent storage of digital objects produced in the reformatting process.
Scheduled action	See definition in Table 8.
Order item	A specific service or product itemized on a work order or purchase order. Includes itemized services and products relating to housing, binding, treatment, or reformatting.
Order	An instruction issued to an employee or an authorization issued to a vendor or supplier to deliver itemized services or products. Includes work orders, purchase orders, etc.; includes orders for housing services, binding services, treatment services, and reformatting services and products.

Commitment	An encumbrance of funds to cover the purchase of a service or product on order.
Vendor	A supplier, dealer, or service provider offering products and/or services related to preservation. Includes providers of housing services, binding services, treatment services (e.g., mass deacidification services), or reformatting services (e.g. microfilming services, digitization services); suppliers of preservation materials and supplies.
Contract	An agreement with a vendor, dealer, or service provider covering the supply of products or services according to established terms and conditions. Includes contracts with providers of housing, binding, treatment, and reformatting services and products. Includes contracts with shipping agents. Includes maintenance contracts.
Delivered product	A unit of product provided in response to an order. Includes product outputs related to housing, binding, treatment, and reformatting.
Payment	An authorized expenditure for services received or products delivered.
Preparation task	A task associated with preparing an item or group of items for housing, binding, treatment, or reformatting. Includes tasks such as collating and examination; preparation and insertion of targets, guides to contents, etc.; preparation of a binding ticket, work order, etc.; clearing reproduction rights.
Quality review task	A task associated with reviewing work done in the housing, binding, treatment, or reformatting processes. Includes visual examination; the application of physical and chemical tests; the flagging of deficiencies.
Procedure, etc.	See definitions in Table 4.

Figure 11: Information Model – Shipping / Receiving

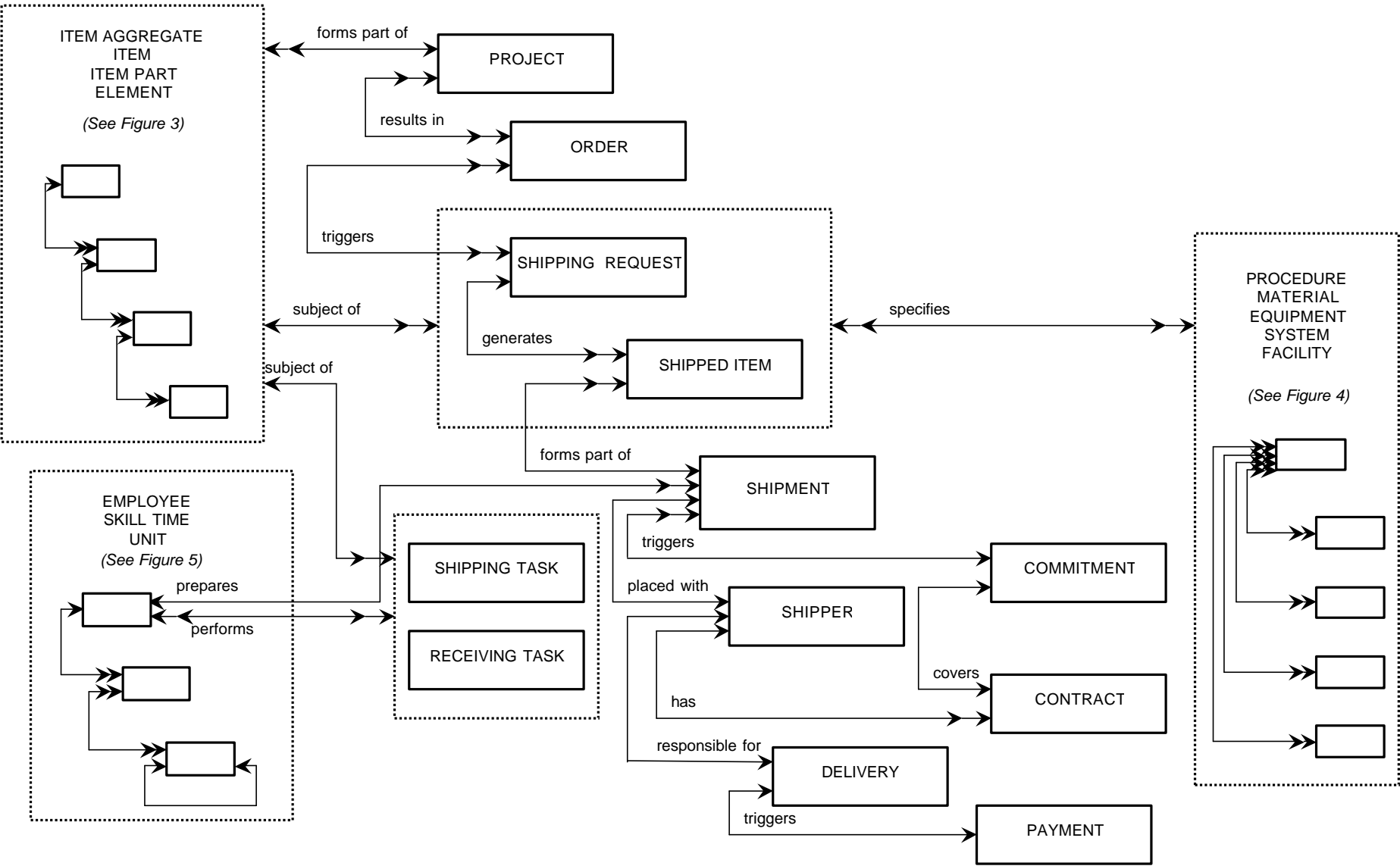


Table 11: Information Model – Shipping / Receiving – Entity Definitions

Entity	Definition / Inclusions / Exclusions
Item aggregate, etc.	See definitions in Table 3.
Employee, etc.	See definitions in Table 5.
Project	See definition in Table 6.
Order	See definition in Table 10.
Shipping request	A requisition for a shipping service. Includes requests for mail, freight, courier, and other transport and delivery services.
Shipped item	A specific article or package itemized on a shipping slip or bill of lading. Includes individual items and groups of items packaged in a single carton or case for delivery to a supplier of housing, binding, treatment, or reformatting services.
Shipment	An article, package, or group of articles or packages consigned to a shipper for delivery as a unit.
Contract	See definition in Table 10.
Commitment	See definition in Table 10.

Delivery	The transfer of a shipped item or shipment to a designated destination.
Payment	See definition in Table 10.
Shipping task	A task associated with shipping an item or group of items. Includes preparation of shipping lists; packing items to be shipped.
Receiving task	A task associated with receiving a shipment from a vendor or shipper. Includes checking of shipping list; unpacking shipment.
Procedure, etc.	See definitions in Table 4.

Figure 12: Information Model – Housing / Binding / Treatment / Reformatting

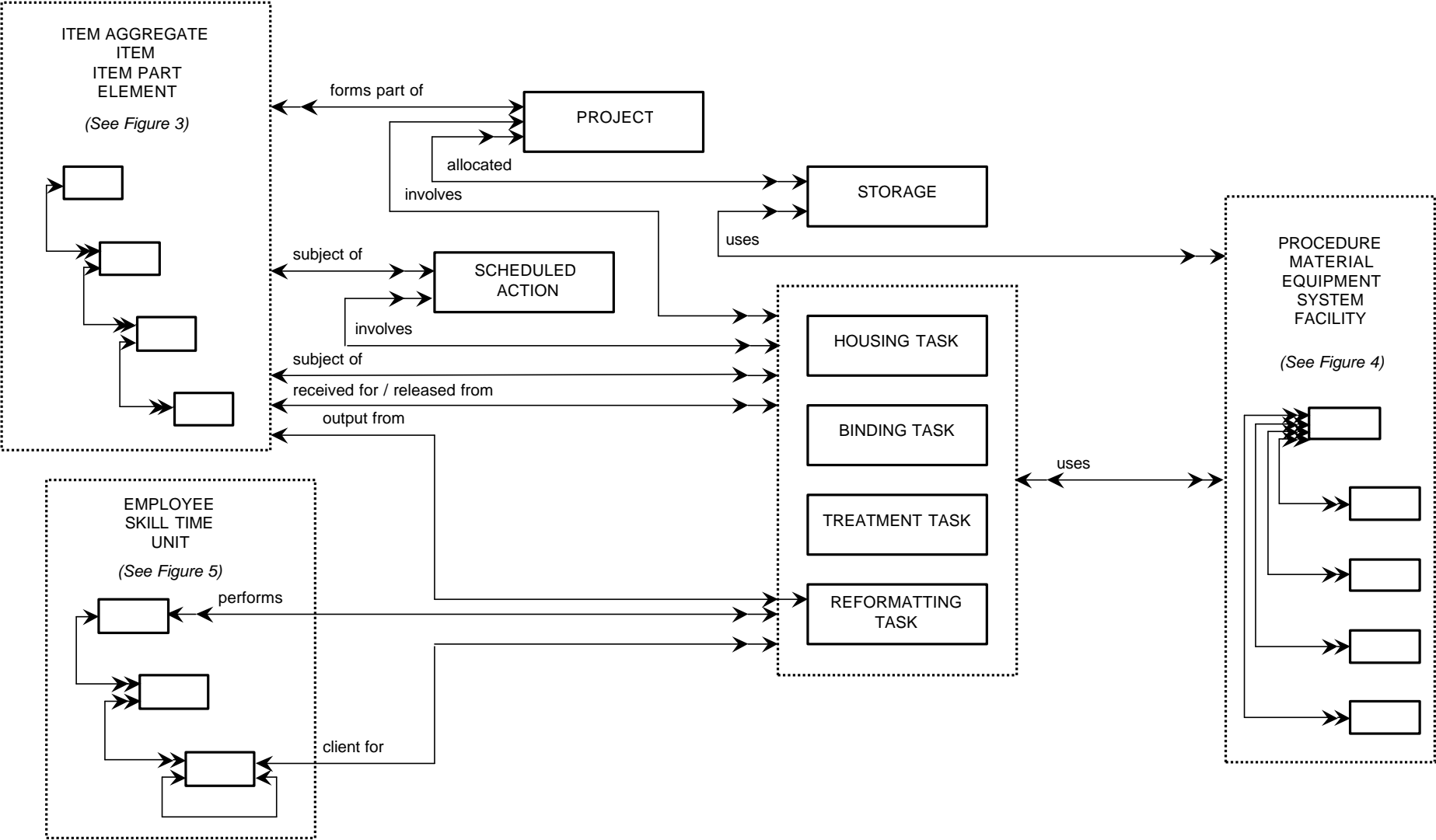


Table 12: Information Model – Housing / Binding / Treatment / Reformatting – Entity Definitions

Entity	Definition / Inclusions / Exclusions
Item aggregate, etc.	See definitions in Table 3.
Employee, etc.	See definitions in Table 5.
Project	See definition in Table 6.
Scheduled action	See definition in Table 8.
Storage	See definition in Table 10.
Housing task	A technical task associated with the process of preparing and/or applying a protective enclosure, casing or housing. Includes tasks such the construction of protective enclosures, casings, etc.; selecting an appropriate pre-fabricated enclosure for an item.
Binding task	A technical task associated with the process of binding a book. Includes tasks such as sewing, the construction and stamping of covers and spines, etc.

Treatment task	A technical task associated with the process of stabilizing or repairing an item through chemical or physical treatment. Includes tasks such as the deacidification and alkaline buffering of books and other paper-based items; chemical “bathing” of microforms and other film-based items; lamination and paper splitting; cleaning; the preparation and application of tip-ins, new covers, etc.; page mending; the replacement of damaged or missing pages; the consolidation of text blocks; [the repair of non-book materials].
Reformatting task	A technical task associated with the process of producing a replacement or alternative for an original item. Includes technical tasks involved in photocopying, microfilming, [“dubbing”,] digitizing, “migrating”, etc.
Procedure, etc.	See definitions in Table 4.

Figure 13: Information Model – Storing

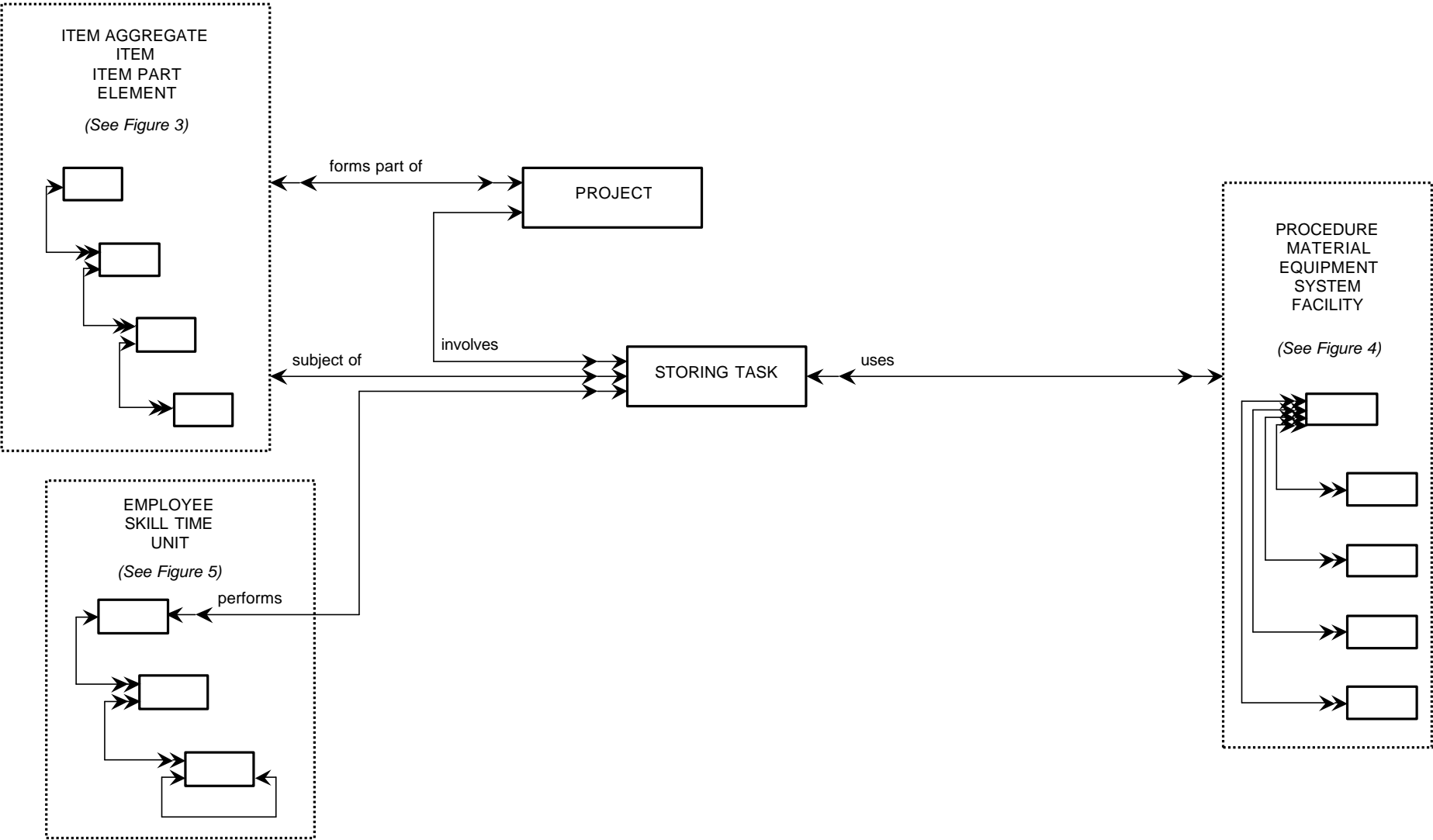


Table 13: Information Model – Storing – Entity Definitions

Entity	Definition / Inclusions / Exclusions
Item aggregate, etc.	See definitions in Table 3.
Employee, etc.	See definitions in Table 5.
Project	See definition in Table 6.
Storing task	A task associated with the process of storing an item for preservation. Includes the storage of microform masters under controlled conditions; the storage of digital masters; the storage of audio-visual items in deep cold storage; the restriction of access to a preservation copy.
Procedure, etc.	See definitions in Table 4.

Figure 14: Information Model – Disposition / Delivery

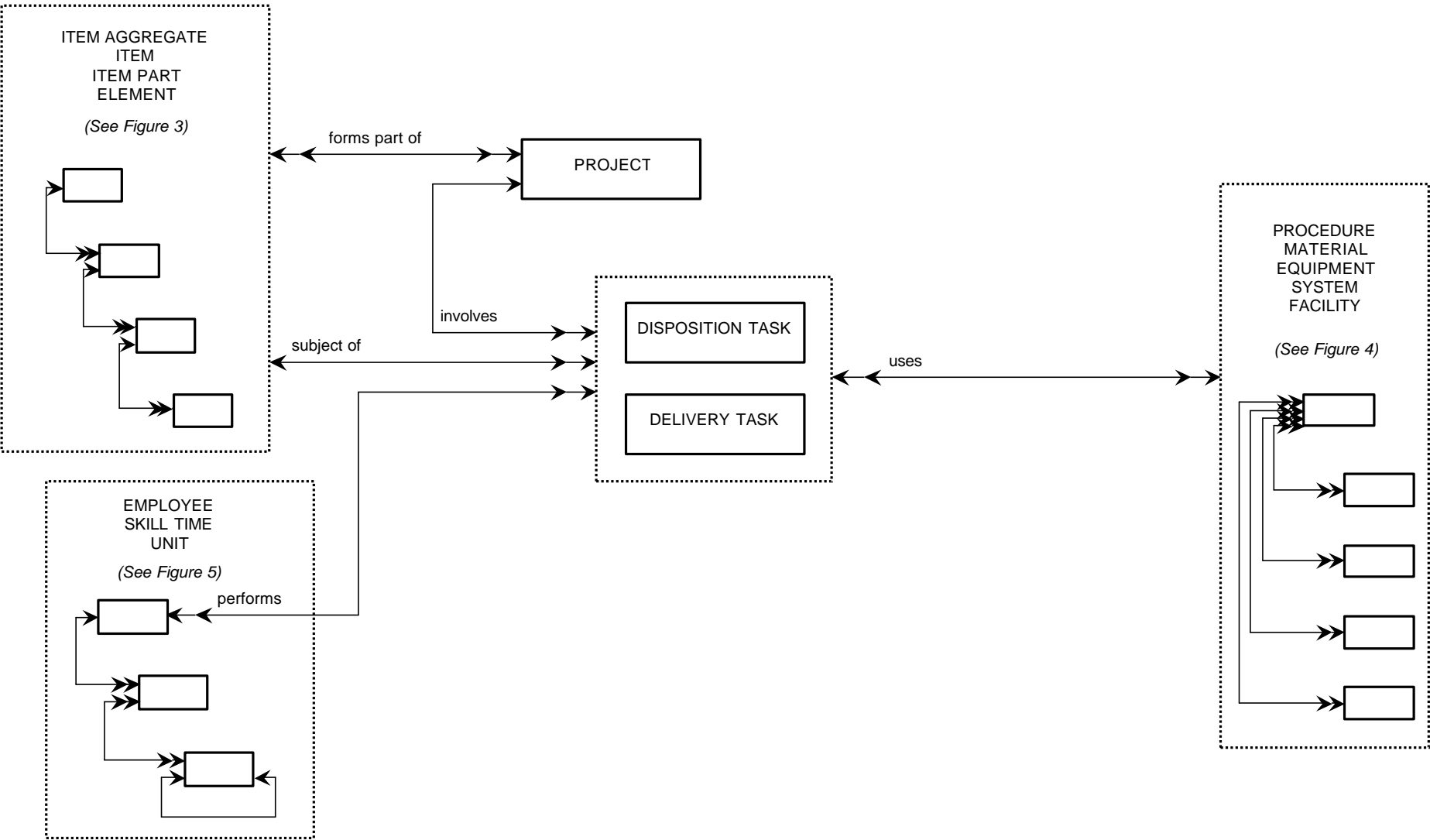


Table 14: Information Model – Disposition / Delivery – Entity Definitions

Entity	Definition / Inclusions / Exclusions
Item aggregate, etc.	See definitions in Table 3.
Employee, etc.	See definitions in Table 5.
Project	See definition in Table 6.
Disposition task	A task associated with the process of de-accessioning an item or group of items from the library's permanent holdings. Includes notifying cataloguing of the de-accessioning; transferring an original copy for de-accessioning.
Delivery task	A task associated with the process of delivering a processed item and/or a reformatted surrogate to a client. Includes delivering originals after completion of housing, binding, treatment, or reformatting; delivering service copies to a custodial division after completion of reformatting; delivering a duplicate copy to a library patron or other client after completion of photo duplication, [dubbing] etc.; wrap up of the preservation process.
Procedure, etc.	See definitions in Table 4.

Figure 15: Information Model – Routing / Tracking

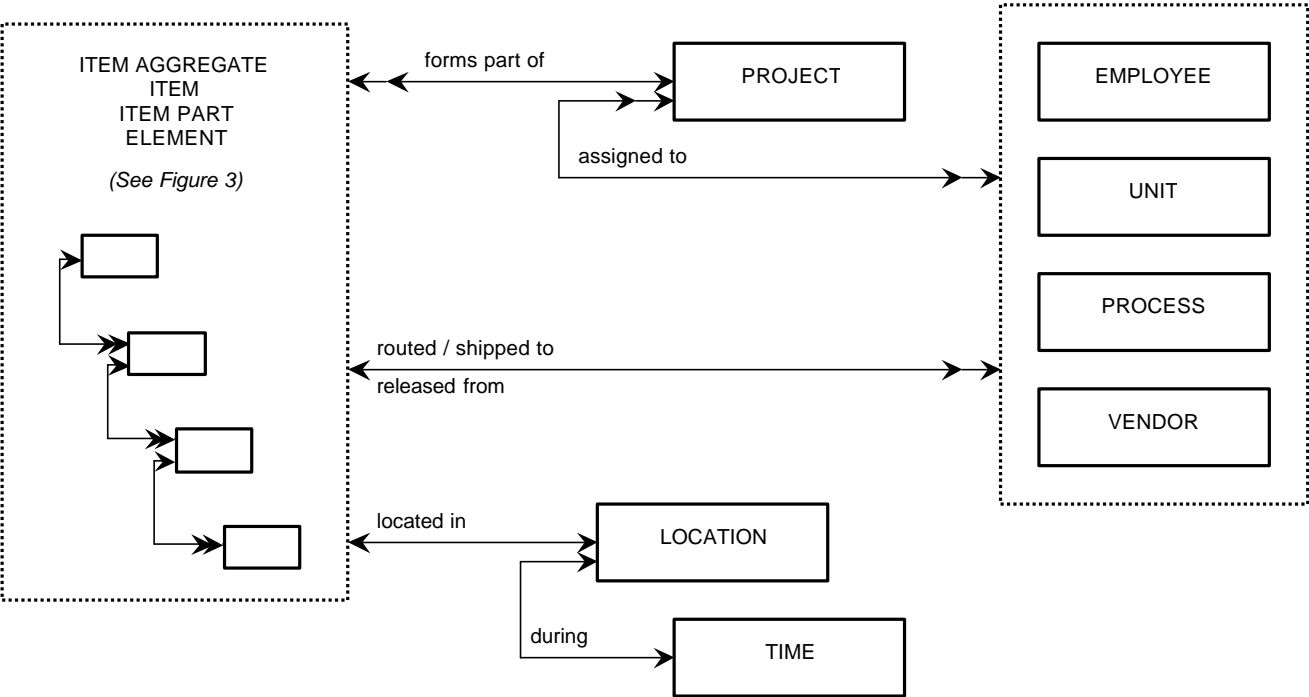


Table 15: Information Model – Routing / Tracking – Entity Definitions

Entity	Definition / Inclusions / Exclusions
Item aggregate, etc.	See definitions in Table 3.
Project	See definition in Table 6.
Employee	See definition in Table 5.
Unit	See definition in Table 5.
Process	An activity or set of related activities associated with preservation. Includes processes such as marking, monitoring, assessing, scheduling, replacement, preparation, shipping, housing, binding, treatment, reformatting, receiving, quality review, storing, disposition and delivery.
Supplier	See definition in Table 10.
Location	See definition in Table 7.
Time	A calendar date.

Figure 16: Information Model – Planning

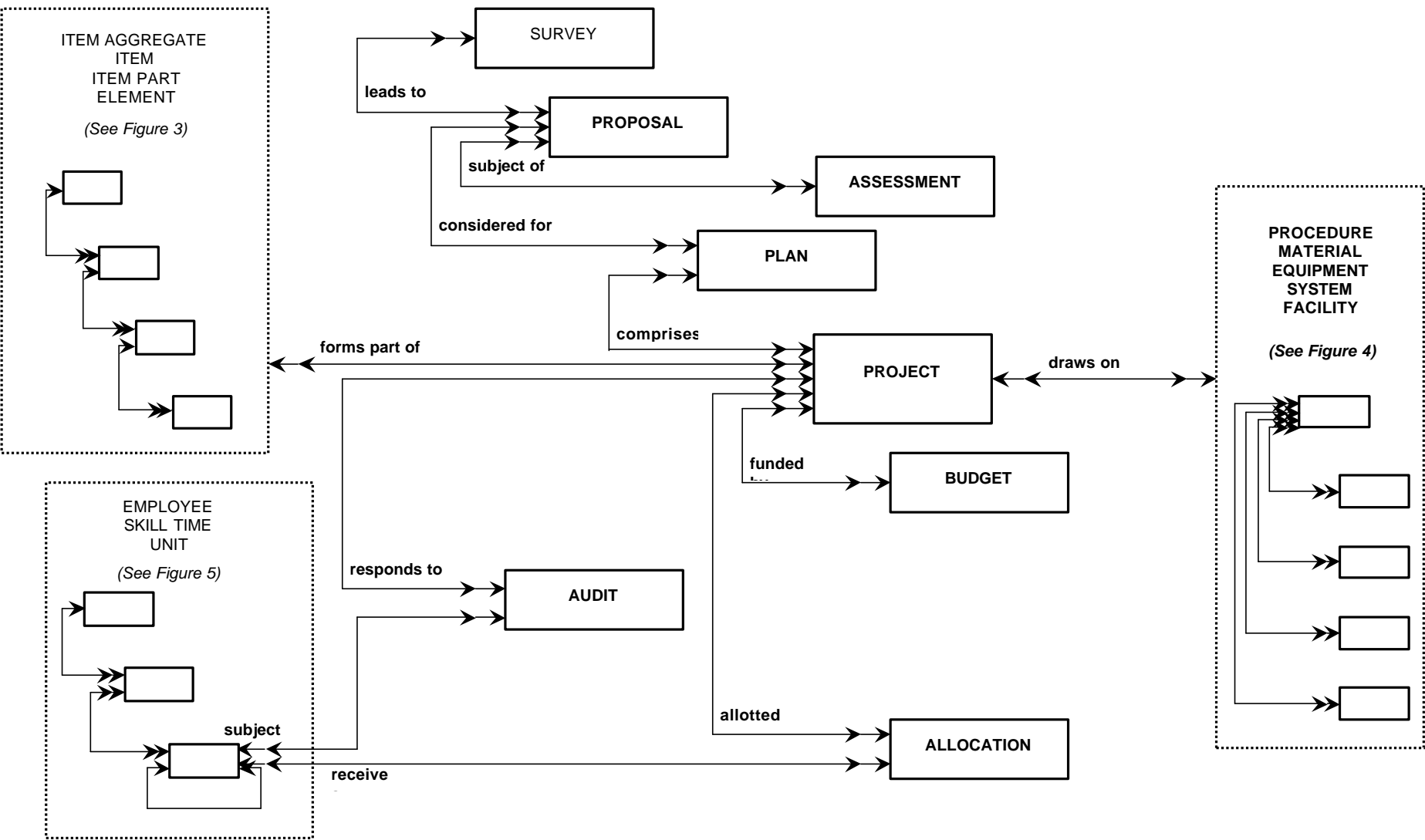


Table 16: Information Model – Planning – Entity Definitions

Entity	Definition / Inclusions / Exclusions
Item aggregate, etc.	See definitions in Table 3.
Employee, etc.	See definitions in Table 5.
Survey	See definition in Table 7.
Proposal	A candidate project for preservation action submitted by a custodial division or other client.
Assessment	See definition in Table 8.
Plan	See definition in Table 8.
Project	See definition in Table 6.
Budget	A financial plan for a given time period or project.
Audit	A systematic examination of an operation to assess/verify conformance with established policy and/or procedures.

Allocation	An allotment of resources to a unit for specified purposes.
Procedure, etc.	See definitions in Table 4.

Figure 17: Information Model – Maintaining Equipment and Supplies

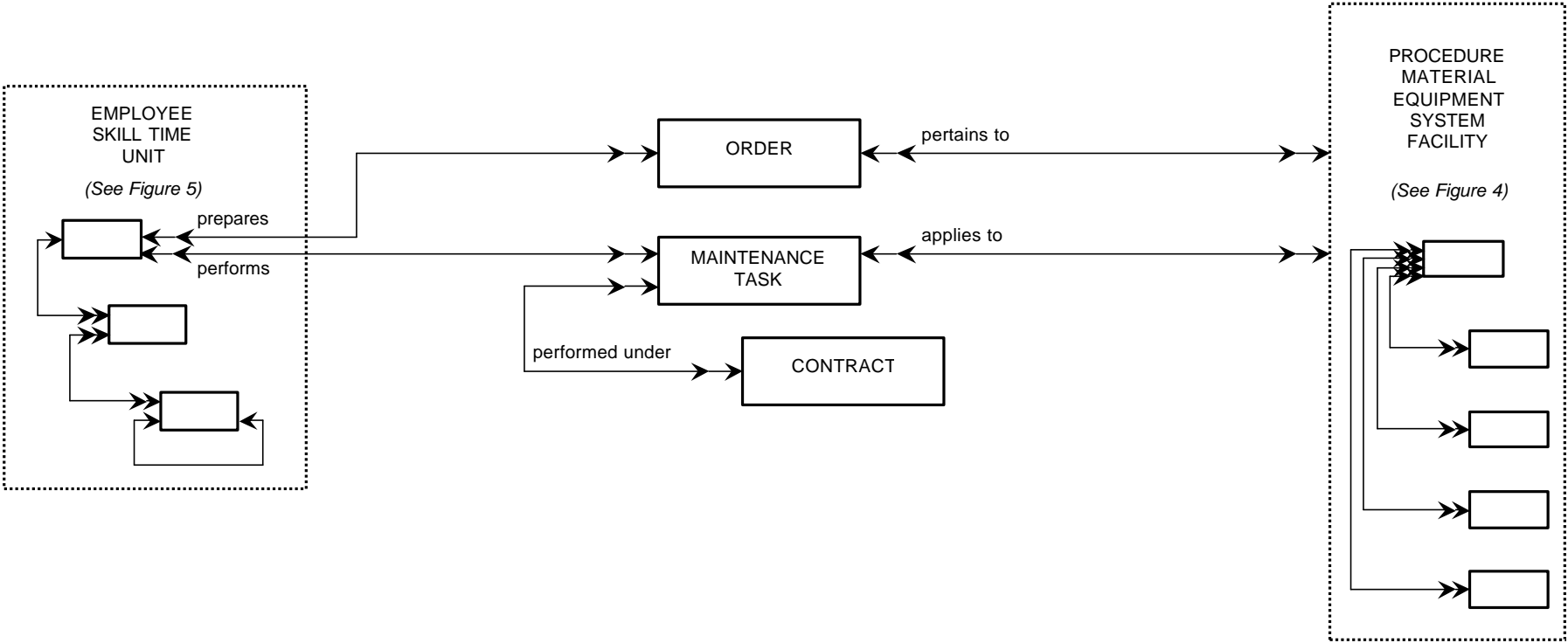


Table 17: Information Model – Maintaining Equipment and Supplies – Entity Definitions

Entity	Definition / Inclusions / Exclusions
Employee, etc.	See definitions in Table 5.
Order	See definition in Table 10.
Maintenance task	See definition in Table 7.
Contract	See definition in Table 10.
Procedure, etc.	See definitions in Table 4.

Figure 18: Information Model – Research / Training / Outreach

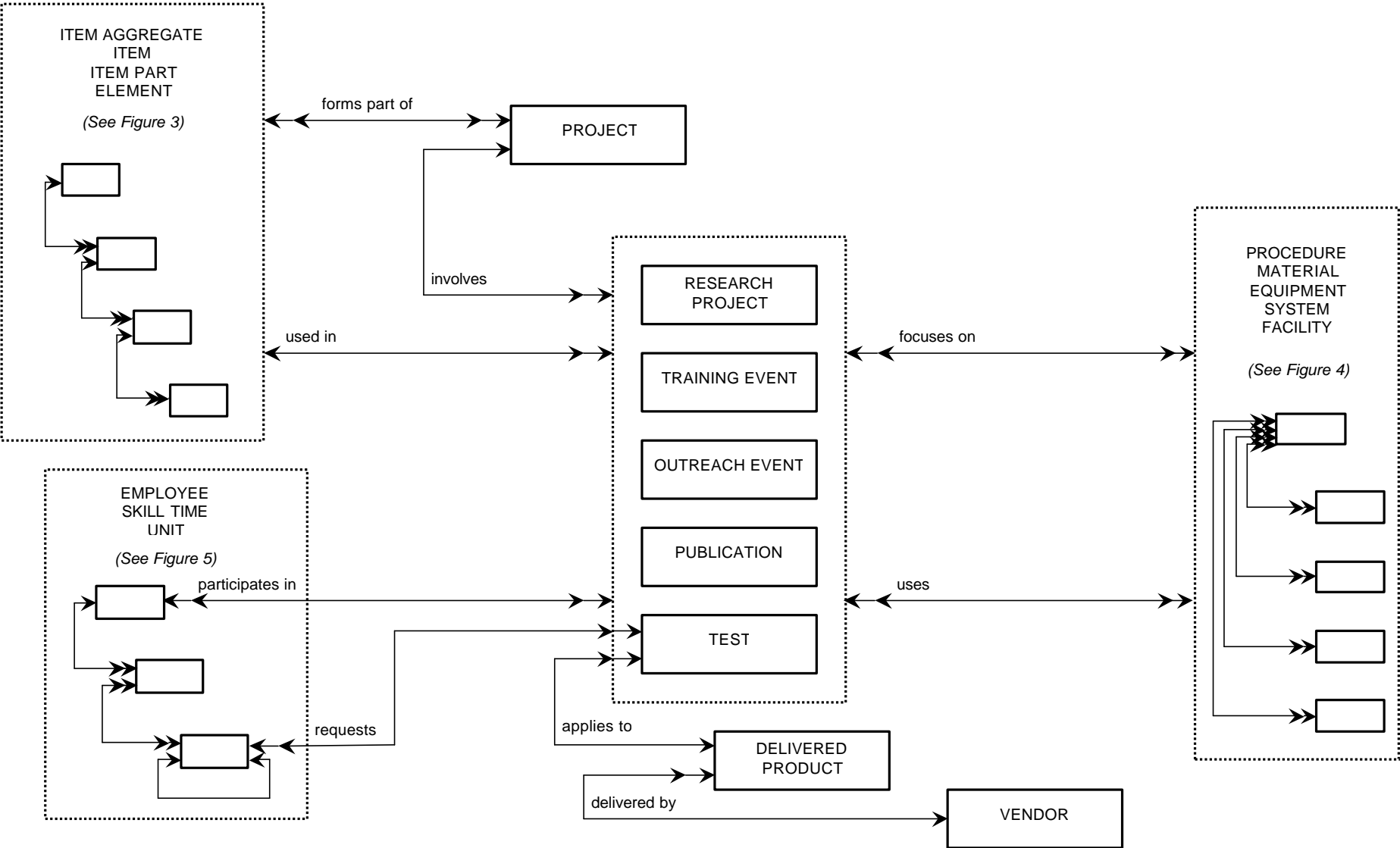


Table 18: Information Model – Research / Training / Outreach – Entity Definitions

Entity	Definition / Inclusions / Exclusions
Item aggregate, etc.	See definitions in Table 3.
Employee, etc.	See definitions in Table 5.
Project	See definition in Table 6.
Research project	A plan or set of tasks associated with the conduct of a specific piece of technical research relevant to the preservation of library materials. Includes research projects on topics such as the permanency of paper and the longevity of photographic, magnetic, and optical media.
Training event	An event associated with the training of library staff, contractors, staff in other libraries, and the public in preservation techniques and procedures. Includes events such as training sessions and workshops.
Outreach event	An event associated with the sharing of knowledge and expertise in preservation matters with individuals and groups outside the Library of Congress. Includes events such as presentations at conferences and symposia.
Publication	A document designed to publicly communicate research findings or information on preservation initiatives and activities. Includes documents published in print, audio, audio-visual, and digital formats, and documents published electronically on the Internet.

Test	A scientific examination or assessment of a material or product to verify its conformance with established specifications or standards.
Delivered product	See definition in Table 10.
Vendor	See definition in Table 10.
Procedure, etc.	See definitions in Table 4.